

Enrofloxacin*

Class: Fluoroquinolone

Overview

Enrofloxacin, a fluoroquinolone approved for use in dogs, cats, cattle and horses, is a veterinary drug used in the treatment of infections caused by both Gram-negative and Gram-positive organisms, including *Staphylococcus* species. In young dogs and horses, damage to the cartilage of the joints and resultant lameness can occur with use of enrofloxacin. Retinal damage resulting in blindness has been observed in cats with the use of higher doses of the drug. Enrofloxacin use is linked to production of crystals in dog urine. Ciprofloxacin is a major metabolite of enrofloxacin. In fact, 25% – 35% of the drug is metabolized to ciprofloxacin in cattle. Like ciprofloxacin, enrofloxacin is excreted in both the bile and in urine; however the drug is excreted primarily by glomerular filtration and tubular secretion. Concurrent use of aluminum, calcium, or magnesium containing antacids, magnesium containing laxatives, multivitamins, sucralfate or zinc may interfere with the drug, limiting uptake. This drug also potentiates theophylline and dosage levels of theophylline may need to be reduced when the two drugs are used concurrently.

Resistance

Cross resistance among ciprofloxacin, enrofloxacin and other fluoroquinolones has been noted. Increased resistance to fluoroquinolones in *Campylobacter* isolates has been reported from countries in Asia, Europe and South America. This increase in fluoroquinolone resistance seems to correlate with administration of enrofloxacin to food animals in these parts of the world. A similar emergence of *Campylobacter* isolates resistant to fluoroquinolones was observed in Minnesota after the introduction of sarafloxacin and enrofloxacin use in poultry in 1995 (sarafloxacin) and 1996 (enrofloxacin).

Please see the discussion of resistance in the ciprofloxacin section.

Effectiveness

Enrofloxacin is bactericidal and is usually effective against most Gram-negative bacteria and against some Gram-positive bacteria, like those found in staphylococcal skin infections such as canine pyoderma. The drug is not as effective against a number of Gram-negative bacteria as with the human drug, ciprofloxacin. An example of inferiority in efficacy compared with ciprofloxacin is observed in therapy for *P. aeruginosa*; this organism tends to be more sensitive to ciprofloxacin. The drug is also deficient in activity against Gram-positive cocci, especially *Enterococcus faecalis* and *faecium* and most anaerobic bacteria. Enrofloxacin is employed against respiratory infections caused by susceptible strains of *E. coli* and *S. aureus* and urinary infections caused by susceptible

strains of *E. coli*, *S. aureus* and *Proteus mirabilis*. In cattle, enrofloxacin is recommended for the treatment of respiratory diseases caused by *Pasteurella hemolytica*, *Pasteurella multocida* and *Haemophilus somnus* and alimentary tract diseases caused by bacteria or mycoplasma organisms. *Chlamydia*, *Mycobacteria*, *Mycoplasma* and *Ureaplasma* species can vary from moderately susceptible to very susceptible to the fluoroquinolones.

***References available by request. Call the Infectious Disease Epidemiology Section, Office of Public Health, Louisiana Department of Health and Hospitals (504-219-4563)**